# Unity’s global illumination systems

**Global illumination** is a group of techniques that you can use in Unity to provide realistic lighting results. These techniques are called global illumination because they simulate both direct and indirect light, rather than just direct light.

There are two different global illumination systems in Unity: the **Baked Global Illumination system** and the **Realtime Global Illumination system**.

## The Baked Global Illumination system

The Baked Global Illumination system includes:

* **Lightmapping:** The process of pre-calculating the brightness of surfaces in a scene and storing the result in a texture called a **lightmap**. This global illumination system uses a specific lightmapper system called the [Progressive Lightmapper](https://docs.unity3d.com/Manual/progressive-lightmapper.html) to complete this process.
* **Light Probes:** A tool to measure (or probe) data about the light that passes through the empty spaces in your scene.
* **Reflection Probes:** A tool to simulate more realistic reflections in Unity.

## The Realtime Global Illumination system

The Realtime Global Illumination system includes:

* **Lightmapping:** This global illumination system uses a deprecated lightmapper called the Enlighten Lightmapper.
* **Light Probes**: Light Probes have some additional functionality in this global illumination system.

The Universal Render Pipeline (URP), which the **Creative Core** pathway uses, does not support the Realtime Global Illumination system.

## Real-time lighting in Unity

Unity calculates real-time lighting **at runtime**, when your game or other real-time experience is running (that is, when it is launched, and users are engaging with the experience). Real-time lights are calculated once per frame, which means that they can be very responsive to moving characters and other elements in your scene.

## Baked lighting in Unity

Baked lighting helps mitigate this problem by pre-calculating lighting data **before runtime.**

The process of performing the calculations and saving that data as a texture called a lightmap is called **baking** or **lightmapping**.

**Skybox Properties:**

Take a moment to review the properties you can configure:

* **Sun:** This is the method that Unity uses to create a sun disk in the skybox. Set this to **Simple**.
* **Sun Size:** This is the size modifier for the sun disk — the higher the value, the larger it will appear in the sky.
* **Atmosphere Thickness:** The density of the atmosphere — the more dense an atmosphere, the more light will be absorbed by it.
* **Sky Tint:** A color tint for the sky.
* **Ground:** The color of the area below the horizon (the ground).
* **Exposure:** This adjusts the sky’s exposure. Larger values produce a more exposed skybox that seems brighter.